Listing of Claims

This listing of claims replaces all prior versions of claims in the application.

1-20. (Canceled)

21. (New) A semiconductor photodetection detector, comprising:

a semiconductor substrate of a first conductivity type;

a photodetection layer formed on said semiconductor substrate;

a region of a second conductivity type opposite to said first conductivity type being formed in a part of said photodetection layer; and

an electrode applying an electric field to said photodetection layer via said region of said second conductivity type such that said electric field acts in a thickness direction of said photodetection layer,

said photodetection layer comprising: a first semiconductor layer having a first thickness and accumulating therein a compressive strain and absorbing an optical radiation; and a second semiconductor layer having a second thickness smaller than said first thickness and accumulating therein a tensile strain, said first semiconductor layer and said second semiconductor layer being stacked alternately and repeatedly in said photodetection layer,

wherein a total of said first thicknesses is smaller than a thickness value Lw represented by a relationship

$$Lw = A \times \varepsilon W + L,$$

where A represents a negative constant, ε W represents said compressive strain, and L represents a constant.

22. (New) A semiconductor photodetection device as claimed in claim 21, wherein said first semiconductor layer accumulates therein a strain of 0.2% or more but not exceeding 0.6%.

23. (New) A semiconductor photodetection device as claimed in claim 21, wherein said first semiconductor layer has a thickness of 50 nm or more.

24. (New) A semiconductor device as claimed in claim 21, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of $(0.9 \times L^{1/4} \times \varepsilon)$ in terms of microns, wherein ε represents that strain accumulated in said first semiconductor layer and L represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

25. (New) A semiconductor photodetection device as claimed in claims 23, wherein the second thickness of the second semiconductor layer is smaller than one-half the first thickness of the first semiconductor.

26. (New) A semiconductor device as claimed in claim 25, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of $(0.9 \times L^{1/4} \times \varepsilon)$ in terms of microns, wherein ε represents the strain accumulated in said first semiconductor layer and L represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

27. (New) A semiconductor photodetection device as claimed in claim 21, wherein each of said first and second semiconductor layers comprises a ternary compound semiconductor material.

28. (New) A semiconductor device as claimed in claim 25, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of $(0.9 \times L^{1/4} \times \varepsilon)$ in terms of microns, wherein ε represents the strain accumulated in said first semiconductor layer and L represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

29. (New) A semiconductor photodetection device as claimed in claim 21, wherein said substrate comprises n-type InP and said first and second semiconductor layers comprise n-type InGaAs.

30. (New) A semiconductor device as claimed in claim 29, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of $(0.9 \times L^{1/4} \times \varepsilon)$ in terms of microns, wherein ε represents the strain accumulated in said first semiconductor layer and L represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

31. (New) A semiconductor photodetection device as claimed in claim 21, further comprising an intermediate layer between said first and second semiconductor layers, said intermediate layer having an intermediate bandgap between a bandgap of said first semiconductor layer and a bandgap of said second semiconductor layer.

32. (New) A semiconductor device as claimed in claim 31, wherein the second thickness of said second semiconductor layer is smaller than a sum of the first and second thicknesses by a factor of $(0.9 \times L^{1/4} \times \varepsilon)$ in terms of microns, wherein ε represents the strain accumulated in said first semiconductor layer and L represents a sum of a total thickness of said first semiconductor layers in said photodetection layer and a total thickness of said second semiconductor layers in said photodetection layer.

33. (New) A semiconductor photodetection device as claimed in claim 31, wherein said intermediate layer is provided at a side of said first semiconductor layer closer to said region of said second conductivity type.

34. (New) A semiconductor photodetection device as claimed in claim 31, wherein said intermediate layer has a composition profile that changes gradually in a thickness direction thereof.

35. (New) A semiconductor photodetection device as claimed in claim 34, wherein said intermediate layer accumulates a tensile strain at a side thereof contacting said second semiconductor layer and a compressive strain at a side thereof contacting said first semiconductor layer.

36. (New) The semiconductor photodetection device as claimed in claim 21, wherein a total thickness of said first and second semiconductor layers is 1.3μm.

37. (New) The semiconductor device as claimed in claim 36, wherein said constant A takes the value of -1μm/%.